

## Three new species of Protura from Brazil

by

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With 3 figures.

***Berberentulus brasiliensis* n.sp.**

Figs. 1 A-L

Holotype ♀ from Belém, Instituto Agronomico do Norte (Rio do Pará region), primeval forest "Mocampo"; a sample was taken from sandy soil up to 5 cm depth, 9.10.1964, Dr. W. Hüther leg. Holotype with allotype ♂ and some paratypes kept in Muséum d'Histoire naturelle, Geneva.

Description. — Length of body 920  $\mu$ , foretarsus without claw 94  $\mu$ .

Head. — Maxillary palp with well-developed terminal tuft of setae and with two seta-like sensillae (fig. F). Labial palp highly reduced with three setae and one sensilla (fig. G). Pseudoculus longer than broad (figs. D, E). Canal of maxillary gland with proximal part of middle length, proximally bipartite (fig. C). PR = 11.

Thorax. — Foretarsus is characterized with very long sensilla *a* which is in the first half broader than the other sensillae on exterior side. Sensilla *b* is relatively short reaching to  $\beta_3$ . Sensilla *a'* on interior side of foretarsus is well developed, in the first third broadened reaching to  $\alpha_4$  (figs. A, B). The ratio of sensillae on exterior side of foretarsus *a* : *b* : *c* : *d* : *e* : *f* : *g* as 59 : 32 : 36 : 41 : 39.5 : 40 : 33.5; on interior side *a'* : *c'* as 40 : 25. BS = 0.38, TR = 3.8, EU = 0.15. Dorsal sensilla  $t_3$  in the right lateral position is willow-leaf shaped

and two times longer than in figures A,B. Tarsus III with well developed empodial appendage (fig. 1).

Abdomen. — The abdominal legs II-III with one large subapical seta and an apical one less than a half its size. The striate band is present as one distal

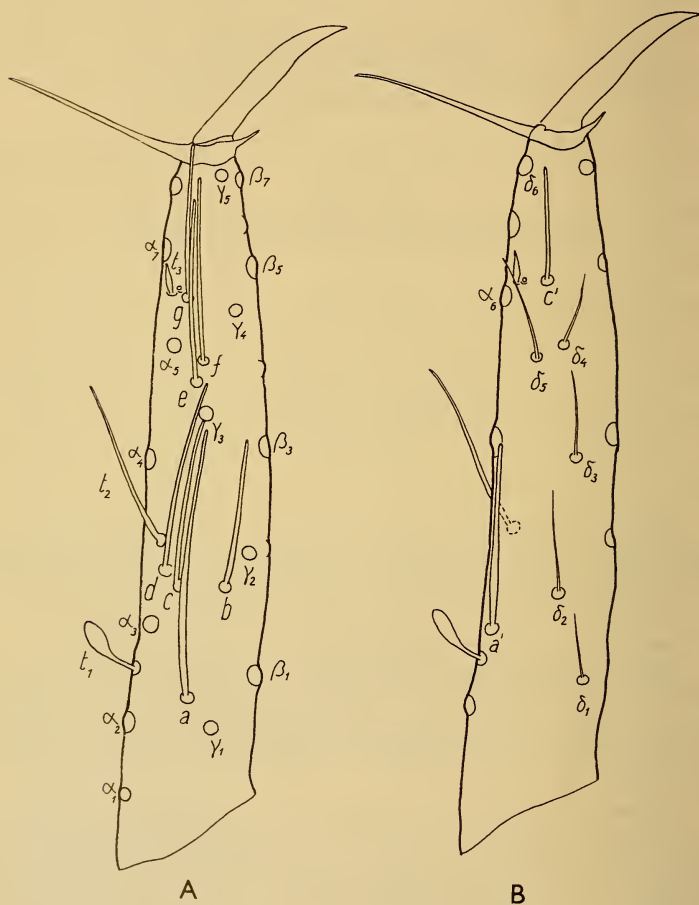


FIG. 1 A-B

*Berberentulus brasiliensis* n. sp. ♀ holotype:

A. Foretarsus in exterior view. — B. Foretarsus in interior view.

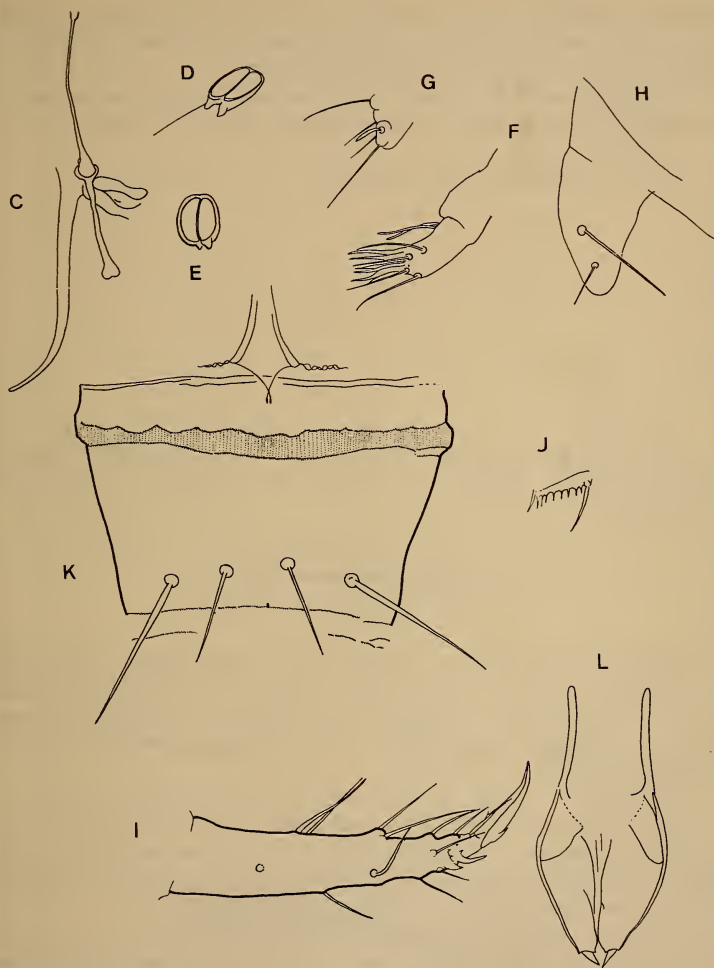


FIG. 1 C-L

*Berberentulus brasilianus* n. sp. ♀ holotype: C. Canal of maxillary gland. — D. Pseudoculus. — E. Pseudoculus from a mat. jun. (paratype). — F. Maxillary palpus. — G. Labial palpus. — H. Abdominal leg III. — I. Tarsus III from a female (paratype). — J. Comb VIII from a mat. jun. (paratype). — K. Stern. VIII. — L. Squama genitalis ♀. (Magnification  $100 \times 10$ ).

transverse serrated line, and a proximal, more or less undulating line with small teeth pointing backwards (fig. K). Comb VIII with about 8 small teeth (fig. J). Squama genitalis ♀ with long pointed acrostyli (fig. L).

The striate band VIII consists of very fine outlet canals of dermal glands. Two large glands are present between the stern. VII and VIII (fig. K).

#### Survey of chaetotaxy in TUXEN's system

	I	II-III	IV-VI	VII	VIII	IX	X	XI	XII
terg.	$\frac{5}{10}$	$\frac{7}{14}$	$\frac{7}{14}$	$\frac{7}{16}$	$\frac{6}{15}$	14	12	4	9
stern.	$\frac{3}{2}$	$\frac{3}{5}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{4}{0}$	4	4	4	6

Affinity. The new species is nearest related to *Berberentulus travassosi* (SILVESTRI, 1938) but differs from it in TR, in ratio of sensillae on foretarsus and in chaetotaxy.

#### *Berberentulus hütheri* n.sp.

Figs. 2 A-K

Holotype ♀ from Campo "Caimbé" (Rio do Pará region, about 60 km NW Belém, on the road to Vigia), brown white sand. The samples were taken in a forest from förna, 16.10.1964, Dr. W. Hüther leg. Holotype with some paratypes mounted in Swan's medium kept in Muséum d'Histoire naturelle, Geneva.

Description. — Length of body 650  $\mu$ , foretarsus without claw 60  $\mu$ .

Head. — Mouthparts are inconspicuous. The sensillae of the maxillary palp are spindle-shaped, the labial palp small with 2 setae and one banana-like sensilla (fig. C). Pseudoculus is circular (fig. D). Canal of maxillary gland with relatively short proximal part, proximally bipartite (fig. E). PR = 11.

Thorax. — Foretarsus is characterized with extraordinarily long, and, in the first third, broadened sensillae *a* and *b*. The other sensillae on exterior side of foretarsus are very fine and thin. Sensilla *a'* on inner side of foretarsus is broad, sword-like (figs. A,B). The ratio of sensillae on exterior side of foretarsus *a : b : c : d : e : f : g* as 33 : 35 : 28.5 : 27 : 27.5 : 27 : 21.5; on interior side *a' : c'* as 23 : 20.5. BS = 0.45, TR = 3.0, EU = 0.15. Tarsus III with well developed empodial appendage (fig. F).

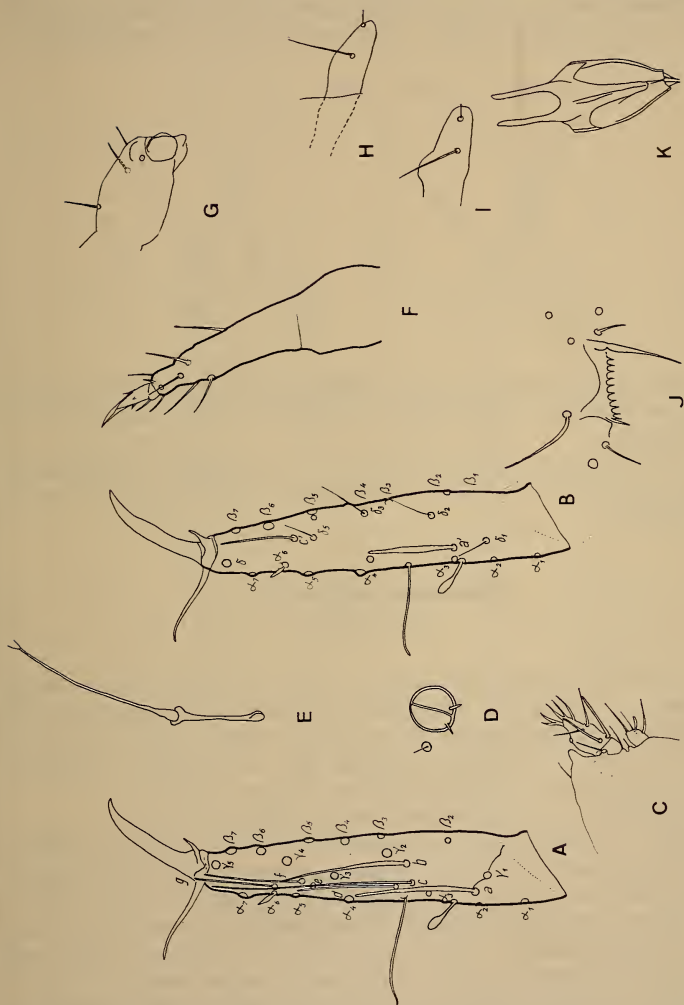


FIG. 2.

*Berberentulus hiiheri* n.sp. ♀ holotype: A. Foretarsus in exterior view. — B. Foretarsus in interior view. — C. Maxillary and labial palpi. — D. Pseudoculus. — E. Canals of maxillary gland. — F. Tarsus III. — G. Abdominal leg I. — H. Abdominal leg II. — I. Abdominal leg III. — J. Comb VIII. — K. Squama genitalis ♀. (Magnification 100×10).

Abdomen. — The abdominal legs II-III with 2 setae. The ratio of apical to subapical seta as 1 : 4 (figs. G,H,I). Comb VIII with 10 teeth of medium length (fig. J). Squama genitalis ♀ with long and sharp acrostyli (fig. K).

Survey of chaetotaxy in TUXEN's system

	I	II-III	IV-VI	VII	VIII	IX	X	XI	XII
terg.	$\frac{6}{10}$	$\frac{8}{14}$	$\frac{8}{14}$	$\frac{6}{16}$	$\frac{6}{16}$	14	12	6	9
stern.	$\frac{3}{2}$	$\frac{3}{5}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{4}{0}$	4	4	4	9

Affinity. This species is closely related to *Berberentulus berberus* (CONDÉ, 1948) but differs from it in TR, EU, in the form of abdominal legs II-III and in pseudoculus.

Derivatio nominis. Named in honour of the well-known entomologist Dr. Hüther, Bochum, who has contributed extensively to the knowledge of European Collembola.

**Eosentomon hoogstraali** n.sp.

Figs. 3 A-L

Holotype ♀ from Rio do Parã region, about 100 km off the road to Brasília (= 145 km, 136° O Belém). The samples were taken in a primeval forest with luxuriant undergrowth from the 0-5 cm layer of B horizon, slightly humid soil, 23.10.1964, Dr. W. Hüther leg. Holotype with some paratypes mounted in Swan's medium kept in Muséum d'Histoire naturelle, Geneva.

Description. — Length of body 850  $\mu$ , foretarsus without claw 81  $\mu$ .

Head. — Maxillary palpi with spindle-shaped sensillae (fig. E), sensilla of labial palpus flame-shaped (fig. F). Clypeal apodeme strong horse-shoe-shaped, opening backwards (fig. D). Pseudoculus small, divided (fig. C), PR = 14.

Thorax. — Foretarsus (figs. A,B). Dorsal sensilla  $t_1$  is situated near the base of  $\alpha_3$ . Praetarsal sensilla  $s$  capitate with slender club. Sensillae  $e$  and  $g$  long, knife-like. The ratio of sensillar on foretarsus in exterior view  $a : b : x : c : d : e : f_1 : f_2 : g$  as 17.5 : 16 : 29 : 15 : 23 : 23.5 : 15 : 7.5 : 26.5; in interior view  $a' : b_2' : c'$  as 17.5 : 18 : 13. BS = 0.9, TR = 4.4, EU = 0.8. Tarsus III with relatively small dorsal spine (fig. K).

Abdomen. — Central lobe of praecosta incised. Chaetotaxy:  $p'_1$  longer than  $p_1$  in terg I-VI and by-passing  $p_1$ . The ratio of setae  $a_1 : a_3$  on stern IX as 22 : 23 (fig. I).



FIG. 3 A-B

*Eosentomou hoogstraali* n. sp. ♀ holotype:

A. Foretarsus in exterior view. — B. Foretarsus in interior view.

Squama genitalis ♀ (fig. J) with very long processus sternales. Caput processus obliquely and smoothly bent against the median edge of stylus. Allae processus a little protruding but situated very distal to caput, filum long.

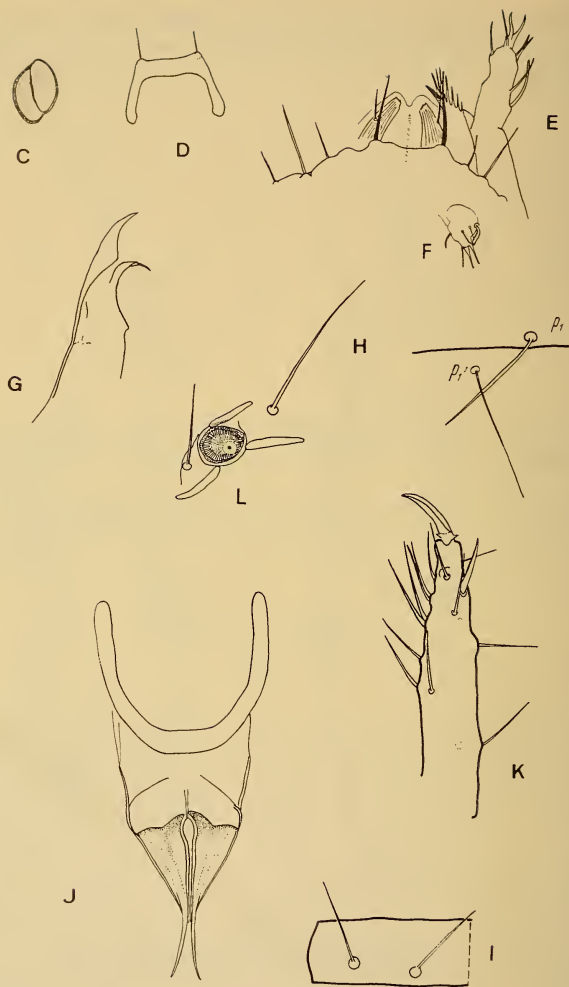


FIG. 3 C-L

*Eosentomon hoogstraali* n. sp. ♀ holotype: C. Pseudoculus. — D. Clypeal apodeme. — E. Forehead with maxillary palpus. — F. Labial palpus. — G. Lobus externus of the maxilla. — H. The ratio of  $p_1$  and  $p_1'$  setae on terg. V. — I. The ratio of setae  $a_1:a_3$  on stern. IX. — J. Squama genitalis ♀. — K. Tarsus III (paratype ♀). — L. Metathoracic spiracle (paratype ♀). (Magnification  $100 \times 10$ ).



## Chaetotaxy in TUXEN's system

	I	II-III	IV	V-VI	VII	VIII	IX	X	XI	XII
terg.	$\frac{4}{10}$	$\frac{10}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{6}{16}$	$\frac{6}{9}$	6	8	8	$\frac{6}{3}$
stern.	$\frac{4}{4}$	$\frac{6}{4}$	$\frac{6}{10}$	$\frac{6}{10}$	$\frac{6}{10}$	$\frac{2}{7}$	4	4	8	$\frac{8}{4}$

Dermal glands 4 in number are present between the terg. VIII and IX, also between IX and X.

Affinity. This species is closely related to *Eosentomon pseudowheeleri* Copeland, 1964, but differs from it in BS, in the position of dorsal sensilla  $t_1$ , dorsal seta  $\alpha_3$ , in the ratio of sensillae  $c : x$ , in central lobe of praecosta and in ratio of  $p_1 : p'_1$  on terg. I-VI.

Derivatio nominis. Named in honour of the famous acarologist Dr. Harry Hoogstraal, Cairo.

## REFERENCES

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